CLAIMS

1. A computer, comprising:

a clock module for producing a clock signal having two or more different frequencies;

a processor, operatively connected to said clock module, for processing instructions in accordance with the clock signal; and

a temperature sensor, operatively connected to said clock module, producing a temperature signal based on the temperature of said processor,

wherein the frequency of the clock signal supplied to said processor varies depending on the temperature of said processor.

~~2. A computer as recited in claim 1, wherein said processor is a microprocessor.~~

~~3. A computer as recited in claim 1, wherein said temperature sensor is thermally coupled to said processor.~~

~~4. A computer as recited in claim 1, wherein said temperature sensor is integral with the circuitry of said processor.~~

~~5. A computer as recited in claim 1, wherein said computer is a portable computing device.~~

~~6. A computer as recited in claim 1, wherein said computer further comprises:~~

~~a fan; and~~

a fan controller, said fan controller controls the speed of the fan in accordance with the chip temperature.

7. A clock control apparatus for a microprocessor, comprising:

a temperature sensor coupled to said microprocessor to monitor a chip temperature of the microprocessor and to produce a temperature signal in accordance with the chip temperature; and

a clock unit, operatively connected to said temperature sensor, for producing a clock for the microprocessor, the clock having a frequency dependent upon the chip temperature of the microprocessor.

8. A clock control apparatus as recited in claim 7, wherein said clock unit comprises a voltage-controlled oscillator (VCO), said VCO receives a chip temperature signal from said temperature sensor and produces the clock having a frequency dependent upon the chip temperature.

9. A clock control apparatus as recited in claim 7,

wherein said clock control apparatus further comprises an activity detector for detecting activity by the microprocessor and producing an activity signal in accordance therewith, and

wherein said clock unit comprises:

a VCO controller for producing a control signal based on the activity signal from said activity detector and a chip temperature signal from said temperature sensor; and

a voltage-controlled oscillator, said voltage-controlled oscillator produces the clock having a frequency dependent upon the control signal.

10. A clock control apparatus as recited in claim 7, wherein said temperature sensor and said clock unit are integral with said microprocessor,

wherein said clock control apparatus further comprises detection means for monitoring activity of the microprocessor, and

wherein the clock produced by said clock unit has its frequency dependent upon both the activity and the chip temperature.

11. A method for producing a clock for a microprocessor,

(a) monitoring chip temperature of the microprocessor;

(b) producing a clock signal having a frequency which varies in accordance with the chip temperature; and

(c) supplying the clock signal to the microprocessor.

12. A method as recited in claim 11, wherein the frequency is altered in real-time as the chip temperature changes, and

wherein the frequency of the clock signal decreases gradually as the chip temperature increases beyond a predetermined chip temperature.

13. A method as recited in claim 11, wherein said producing (b) comprises:

(b1) receiving a slow frequency clock and a fast frequency clock; and

(b2) selecting the slow frequency clock if the chip temperature exceeds a predetermined temperature, otherwise selecting the fast frequency clock.

14. A method as recited in claim 11,

wherein said method further comprises (d) monitoring activity of the microprocessor, and

wherein said producing (b) comprises:

(b1) receiving a slow frequency clock and a fast frequency clock; and

(b2) selecting the slow frequency clock if the chip temperature exceeds a predetermined temperature or if there is no activity at the microprocessor, otherwise selecting the fast frequency clock.

15. A method as recited in claim 11,

wherein said method further comprises (d) monitoring activity of the microprocessor, and

wherein said producing (b) comprises:

(b1) receiving a plurality of clocks, each clock having a different frequency; and

(b2) selecting one of the clocks based on the chip temperature and the activity of the microprocessor.

16. A method as recited in claim 15, wherein one of the clocks is an overdrive clock, and

wherein the overdrive clock is selected when certain activity is present and the chip temperature is below a predetermined temperature.

17. A method as recited in claim 16, wherein when the certain activity is completed the overdrive clock is replaced by one of the other clocks.

18. A method as recited in claim 11, wherein said producing (b) comprises (b1) producing a variable-frequency clock, the frequency of the variable-frequency clock being varied in accordance with the chip temperature.

19. A method as recited in claim 18,

wherein said method further comprises (d) monitoring activity of the microprocessor, and

wherein said producing step (b) further comprises:

(b2) receiving a fixed-frequency clock; and

(b3) selecting one of the variable-frequency clock and the fixed-frequency clock based on the activity of the microprocessor.

20. A method as recited in claim 11, wherein said method further comprises (d) producing a variable-speed control signal for a fan with the speed being dependent on the chip temperature.

Add B4

Add C1

ADD D'7